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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,680	07/17/2002	Christine Engel	10191/2217	3823

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EXAMINER	
JAGAN, MIRELLYS	
ART UNIT	**PAPER NUMBER**
2859	

DATE MAILED: 01/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/069,680	ENGEL ET AL.	
	Examiner	Art Unit	
	Mirellys Jagan	2859	

-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/22/04*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-19,21 and 24-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-19,21 and 24-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 July 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 14-18, 21, and 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over British Patent 900774 to Siemens in view of U.S. Patent 4,336,215 to Yajima et al [hereinafter Yajima] and Japanese Patent 2001226723 to Harada et al [hereinafter Harada].

Siemens discloses a thermocouple comprising a first (10) and a second (11) element, wherein:

the first element and the second element are in contact with each other in an area (8) of at least one contact point,

at least in one vicinity of the contact point the first element includes a first ceramic material and the second element includes a second ceramic material that may be the same or different from the first ceramic material, wherein the material of the first element and the second element have an at least approximately equal thermal expansion coefficient at least in the vicinity of the contact point when the first and the second materials are the same,

a material of the first element and the second element are configured so that at the contact point one of a contact voltage occurs in accordance with a Seebeck effect and a temperature

change occurs in response to an impressed external electric current ion accordance with a Peltier effect,

the first and the second elements are electrically interconnected with one of a device configured to measure the contact voltage and a device configured to impress an external electric current flowing through the contact point, and

at least one of the first and the second ceramic material includes at least one temperature-resistance electrically semiconductive filler material (see figure 3, page 2, lines 81-90, page 3, lines 21-28, and page 4, lines 1-37).

Siemens does not disclose the filler material being one of FeCr and FeCrNi; at least one of the first and the second ceramic materials including one of SiC, SiCN, SiTiCO, SiCO, SiBCN, SiBCO, BCN, SiAlCO, SiAlNCO, and SiCON compounds; and is silent as to the manner in which the first and second materials is obtained, i.e., does not disclose at least one of the first and the second ceramic materials being obtained by pyrolysis of one of a polymeric precursor material and a polymeric precursor material that includes at least one filler material, or the first ceramic material being obtained by pyrolysis of one of a first polymeric precursor material and a first polymeric precursor material that includes at least one first filler material, and the second ceramic material being obtained by pyrolysis of one of a second polymeric precursor material and a second polymeric precursor material that includes at least one second filler material, wherein the first and second precursor materials undergo approximately equal shrinkage in the vicinity of the contact point in response to pyrolysis.

Yajima discloses a ceramic component having a ceramic composite material containing a filler material. The ceramic material is obtained by pyrolysis of a polymeric precursor material

such as SiC that includes at least one filler material, such as a carbide (which can have approximately metallic conductivity or electrical semiconductivity). The ceramic material such as SiC is obtained by pyrolysis of a polymeric precursor material that may include at least one filler material, wherein the ceramic material is a powdered form that may be molded into any desired shape. Yajima teaches that the ceramic material has excellent mechanical strength and corrosion-resistant properties that are useful for making a thermocouple (see column 6, lines 32-56; and column 11, lines 21-25 and 46-47).

Harada discloses a ceramic material for providing an electrode substrate comprising a ceramic having a carbide filler. The filler can also be FeCr or FeCr alloys for making a metallic porous body that has mechanical strength and corrosion-resistant properties and is useful as an electrical conductor (electrode).

Referring to claims 14 and 29, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thermocouple disclosed by Siemens by replacing the ceramic material(s) used to make the thermocouple with a ceramic material(s) as taught by Yajima, in order to provide a thermocouple having mechanical strength and corrosion-resistant properties to extend the life of the thermocouple.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thermocouple disclosed by Siemens and Yajima by using FeCr or FeCr alloys as the filler material, since Harada teaches that FeCr or FeCr alloys are useful fillers for providing an electrically conductive ceramic material having mechanical strength and corrosion-resistant properties.

Referring to claim 28, Siemens, Yajima, and Harada disclose that the ceramic materials have very low thermal expansion characteristics. Therefore, approximately equal shrinkage will occur in response to pyrolysis.

Further referring to claim 29, the method steps of claim 29 will be followed in creating the thermocouple disclosed by Siemens, Yajima, and Harada stated above.

3. Claims 14-19, 21, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 2,981,775 to Bachman in view of Yajima and Harada.

Bachman discloses a thermocouple comprising a first (31) and a second (32) element, wherein:

the first element and the second element are in contact with each other in an area of at least one contact point,

at least in one vicinity of the contact point the first element includes a first ceramic material and the second element includes a second ceramic material that is different from the first ceramic material and a solderable metal (wire),

a material of the first element and the second element are configured so that at the contact point a contact voltage occurs in accordance with a Seebeck effect,

the first and the second elements are electrically interconnected with a device configured to measure the contact voltage, and

at least one of the first and the second ceramic materials includes at least one electrically semiconductive filler material (see figures 2 and 3, and column 3, lines 20-69).

Bachman does not disclose the filler material being one of FeCr and FeCrNi.

Yajima discloses a ceramic component having a ceramic composite material containing a filler material. The ceramic material is obtained by pyrolysis of a polymeric precursor material such as SiC that includes at least one filler material such as a carbide or a nitride (which can have approximately metallic conductivity or electrical semiconductivity). The ceramic material such as SiC is obtained by pyrolysis of a polymeric precursor material that may include at least one filler material, wherein the ceramic material is a powdered form that may be molded into any desired shape. Yajima teaches that the ceramic material has excellent mechanical strength and corrosion-resistant properties that are useful for making a thermocouple (see column 6, lines 32-56; and column 11, lines 21-25 and 46-47).

Harada discloses a ceramic material for providing an electrode substrate comprising a ceramic having a carbide filler. The filler can also be FeCr or FeCr alloys for making a metallic porous body that has mechanical strength and corrosion-resistant properties and is useful as an electrical conductor (electrode).

Referring to claims 14 and 29, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thermocouple disclosed by Bachman by replacing the ceramic material(s) used to make the thermocouple with a ceramic material(s) as taught by Yajima, in order to provide a thermocouple having mechanical strength and corrosion-resistant properties to extend the life of the thermocouple.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thermocouple disclosed by Bachman and Yajima by using FeCr or FeCr alloys as the filler material, since Harada teaches that FeCr or FeCr alloys are

useful fillers for providing an electrically conductive ceramic material having mechanical strength and corrosion-resistant properties.

Further referring to claim 29, the method steps of claim 29 will be followed in creating the thermocouple disclosed by Bachman, Yajima, and Harada stated above.

Response to Arguments

4. Applicant's arguments with respect to claims 14-19, 21, and 24-29 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents disclose a thermoelectric composition:

U.S. Patent 4,731,127 to Itoyama
U.S. Patent 971,767 to Marsh
U.S. Patent 2,961,960 to Poch et al
U.S. Patent 3,411,956 to Sibley et al

The following patents disclose a thermocouple:

U.S. Patent 885,430 to Bristol
U.S. Patent 2,912,477 to Fischer et al

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mirellys Jagan whose telephone number is 571-272-2247. The examiner can normally be reached on Monday-Friday from 11AM to 4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJ
January 26, 2005

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